AppleScript Update

Session 106

AppleScript Update

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Manager, Components and Scripting

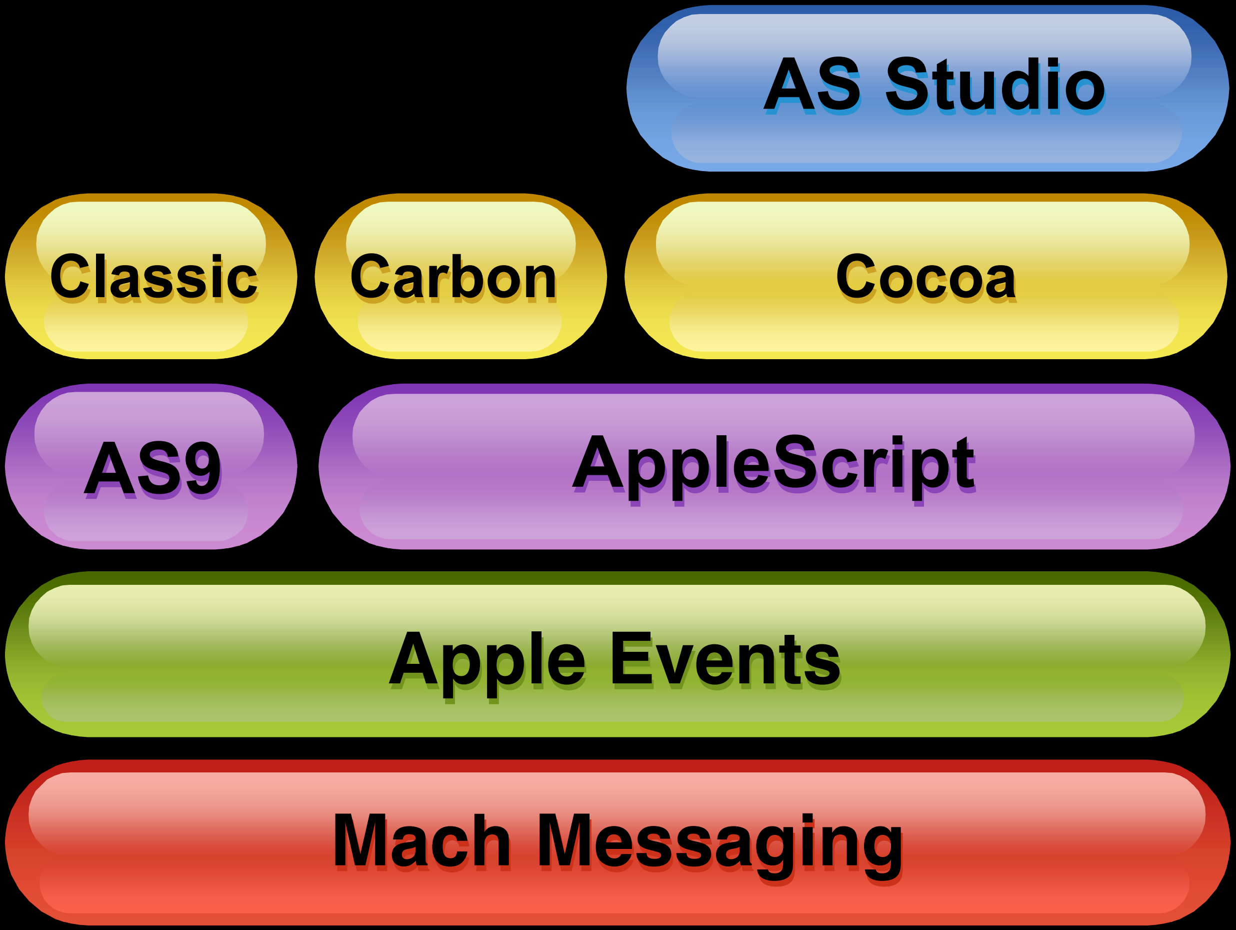
Introduction

- Annual overview of AppleScript
- Review changes in AppleScript 1.7 through 1.8.3
- Look forward to AppleScript 1.9 and (drum roll . .) AppleScript X!

What You Will Learn

- What you must do to adapt to changes in the Apple Event Manager
- What you must do to adapt to changes in AppleScript
- What you will be able to do with the new AppleScript architecture

Technology Framework



Thank You Developers!

Absird
Acgi Dispatcher
Adobe Photoshop 7
Alarm Clock S. E.
Albert
Audion 2
Big Cat
BTV Pro
CardBook
CE QuickMail Office
CelView
Chipmunk BASIC
ChronoSync
CSS Suitcase
DMG Tool
Download Deputy
DropDMG

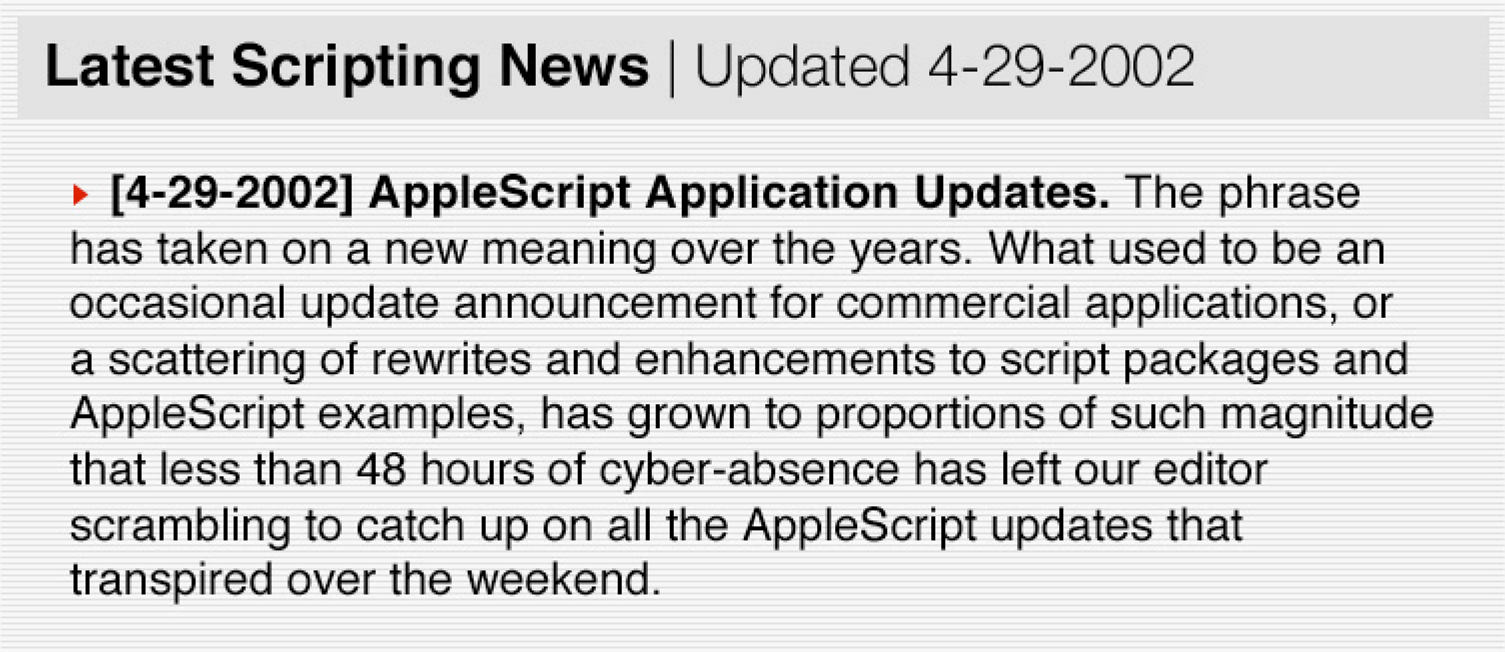
eMail Alert!
Eps2pdf
Eudora
FBScriptAgent
GraphicConverter
HotApp
HTML Converter
iAlarm
IconBrush
ImageInfo
Image Rodeo
IP Addresser
iPhoto Library Mgr.
iSleep
iTunes Library Mgr.
JavaScheduler
JavaScript OSA

JChecker X
JEdit
Key Xing
Link-O-Mat
Location X
MacPython
Mailsmith
Mamgoo
Manila Envelope
MOA Tunes
MoosePad
NetSmith
OmniOutliner
OmniGraffle
osXIgen
OSXMacPerl
Palm Desktop

piTime
Pix Lite
Play Sound
Popup Dock
Prefs Overload
Presentattion
Prompter
QuartzDraw
Real BASIC
Resorcerer
SafeShred
Say What
Scheduler
Script Timer
ScriptDebugger
SmartWrap
Speed Download

SSHPassKey
Stone Studio
StreamCatcher
SuiteModeler
Text Wielder
TWScripter
uCalendar
Unix Date
Valentina
VOODOO Server
VR Worx
WeatherManX
WebMiner
XML Tools
Yamp3R
YVS Picture Translator

Thank You Developers!



Latest Scripting News | Updated 4-29-2002

▸ **[4-29-2002] AppleScript Application Updates.** The phrase has taken on a new meaning over the years. What used to be an occasional update announcement for commercial applications, or a scattering of rewrites and enhancements to script packages and AppleScript examples, has grown to proportions of such magnitude that less than 48 hours of cyber-absence has left our editor scrambling to catch up on all the AppleScript updates that transpired over the weekend.

Demo

Obligatory Version Summary

- 1.6 in Mac OS X 10.0
- 1.7 in Mac OS X 10.1, 9.2.2 Software Update
- 1.8.1 in Jaguar, December 2001 Developer Tools
- 1.8.2 with April 2002 Developer Tools
- 1.8.3 as an independent software update for Mac OS 9 and Mac OS X (coming soon)

OSA Scripting in Jaguar

OSA Scripting in Jaguar

- New Apple Event Manager
- Scriptability enhancements
- Two versions of AppleScript
    - AppleScript version 1.9 (minor enhancements)
    - AppleScript X (new architecture)
- AppleScript Studio version 1.2

New Apple Event Manager

New Apple Event Manager

- Event payloads are now flat, not handle-based
- Event payloads can be referenced instead of copied
- Events are shared between applications, rather than copied and sent
- Result: up to 1000x performance improvement for large events

New Apple Event APIs

AEGetDescDataRange

- Extracts specified information from an AEDesc—use this to get a little information out of a large AEDesc

AECreateDescFromExternalPtr

- Creates an AEDesc using your data, instead of copying it—a callback lets you know when it is OK to dispose of the data

New Apple Event Types

typeUTF8

- Data is UTF-8 encoded text
- Coercions to/from typeUnicodeText, typeText, typeStyledText

typeISO8601Time

- Data is a UTF-8 string of the ISO time
- Coercions to/from typeLongDateTime

New Apple Event Manager

Things to watch out for

- You cannot access the payload of an Apple event directly (except to set to or check for null)
- You cannot extract the data of an Apple event data structure (list, record, Apple event)
- Remember to use streaming APIs when saving AEDesc values to disk or to the Pasteboard (scrap)

Scriptability in Jaguar

Scriptability Enhancements

- Folder Actions lives!
- Significant improvements in Cocoa scripting
- New scriptable apps and improvements
  - Address Book, Mail, Sherlock, Apple System Profiler, Speech Recognition
  - Digital Hub feature has a script execution option
  - Initial Preferences Scripting support

AppleScript 1.9

AppleScript 1.9

- Ongoing evolution of AppleScript 1.x
- Focus is backwards-compatibility with legacy AppleScripts
- Continued bug fixes and platform accommodations

AppleScript 1.9 Changes

- formName can now be Unicode text
    - Unicode string object specifiers used to be delivered as formAbsoluteIndex

AppleScript 1.9 Enhancements

- Support for System Preferences plug-ins
    - “tell system” block can target plug-ins
- SMB support in mount volume
- “say” to disk file

Demo

AppleScript 1.9

Things to watch out for

- NSAppleScriptEnabled = YES flag now required in your app’s Info.plist
- formName can be Unicode text
- Minimize use of all unencoded text types (e.g., typeChar, typePString, typeCString); they will be deprecated soon

AppleScript Futures

Christopher Nebel
AppleScript X Lead Engineer

Driving Forces

- From application writers
  - “Too hard to develop terminology”
  - “Too hard to implement scripting”
  - “Cannot make plug-ins scriptable”
- From scripters
  - “Does not support its own object model”
  - “OSAXen are too limited”
  - “Not international-aware”

Driving Forces: The Answers

- XML-based terminology format
- Codeless terminology
- Carbon Scripting
- Support scriptable plug-ins
- AppleScript X

Defining Terminology in XML

- .sdef files—a superset of the ‘aete’
- Edit with any validating XML editor
- Tools can generate
    - ‘aete’ resources
    - .scriptSuite and .scriptTerminology
    - Definition files for Carbon Scripting

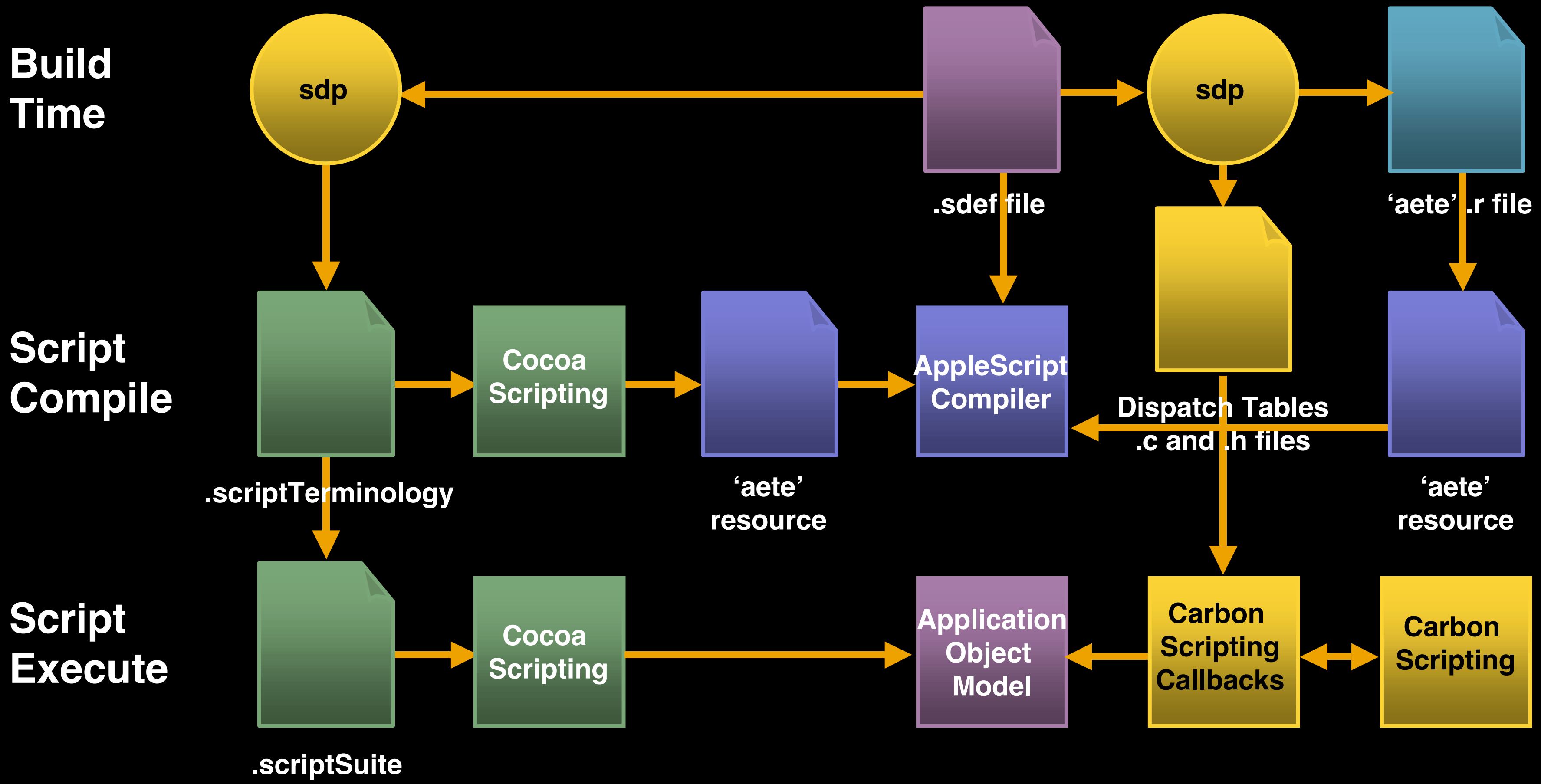
Structure of an .sdef File

```
<dictionary title="">
    <suite name="File Scripting" code="file">
        <verbs>
            <verb name= "save" code= "coresave">
                <dp type="object"/>
                <parameter name="in" code="kfil"
                    type="file" optional="optional"/>
            </verb>
        </verbs>
        <classes>
            <class name="application" code="capp”/>
        </classes>
    </suite>
</dictionary>
```

Structure of an .sdef File

```
<class name="container" code="ctnr" inherits="item">
    <elements>
        <element type="item">
            <accessor style="index"/>
        </element>
    </elements>
    <properties>
        <property name="name" code="pnam"
            type="string"/>
        <property name="container" code="ctnr"
            type="container" access="r"
            more="The enclosing folder or disk"/>
    </properties>
</class>
```

Using .sdef Files



Demo

Codeless Terminology

- Some terms may not want four-character codes
    - Plug-ins where conflicts could arise
    - Web services
- AEDesc descriptorType fields will always be four-character codes

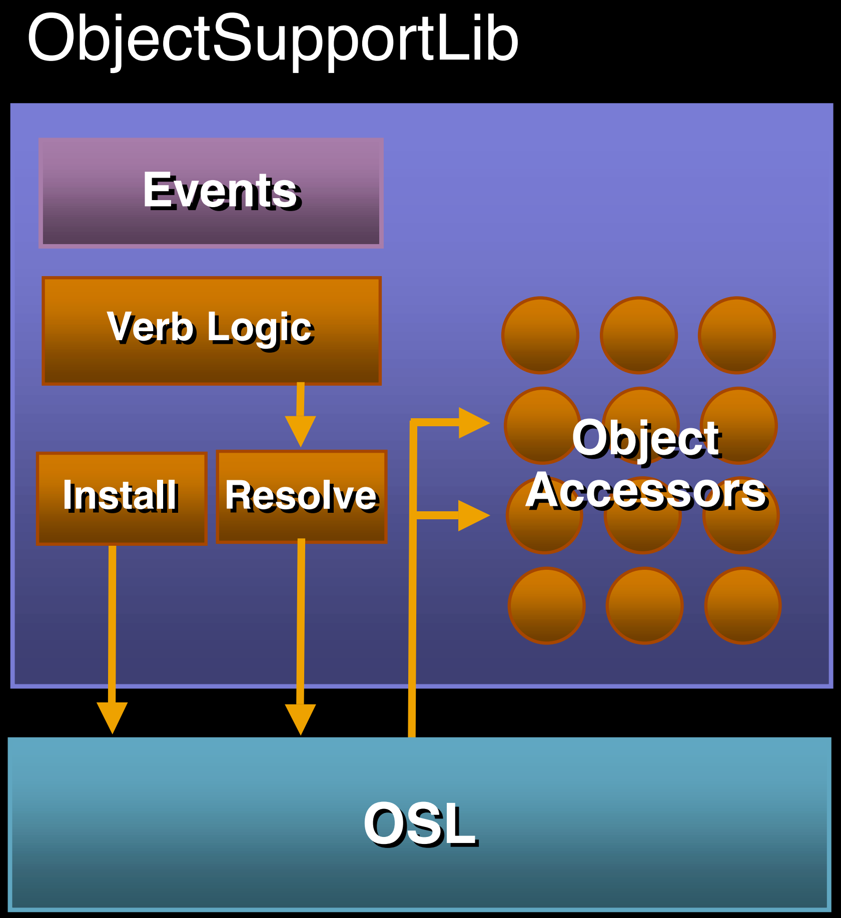
Using Codeless Terminology

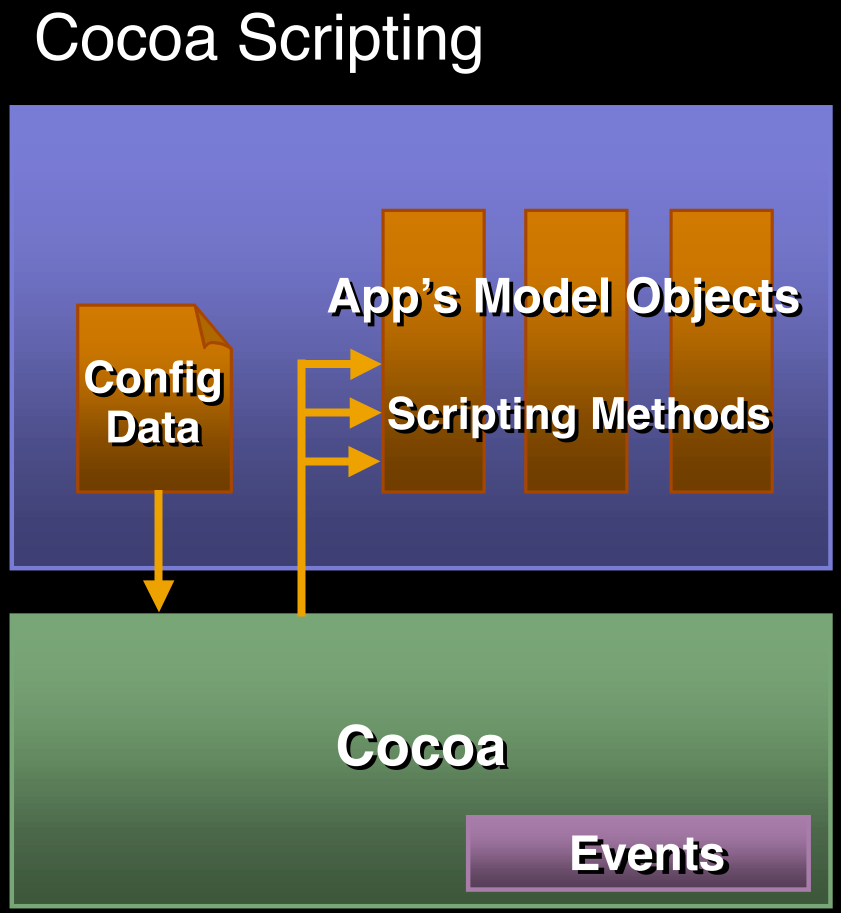
- You can define terminology with no codes
- AppleScript X will send events with names for events, classes, etc.
    - Much like ‘psbr’ events and ‘usrf’ records
- We’ll provide parallel library to AEDataModel.h that does all interesting things with codeless Apple Events Manager structures

Carbon Scripting

- A Carbon (flat C) parallel to Cocoa Scripting
- Built around object method callbacks, not accessor routines
- Does more for you than ObjectSupportLib
- Will work with both AppleScript 1.x and AppleScript X—though it is Mac OS X only

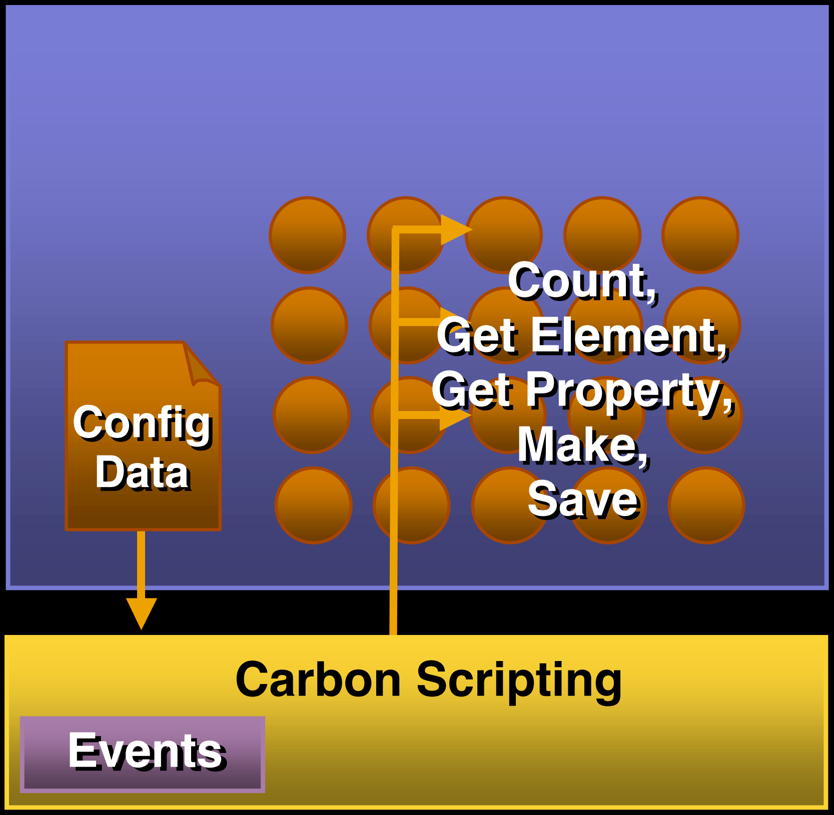
Carbon Scripting





Carbon Scripting

With a C application



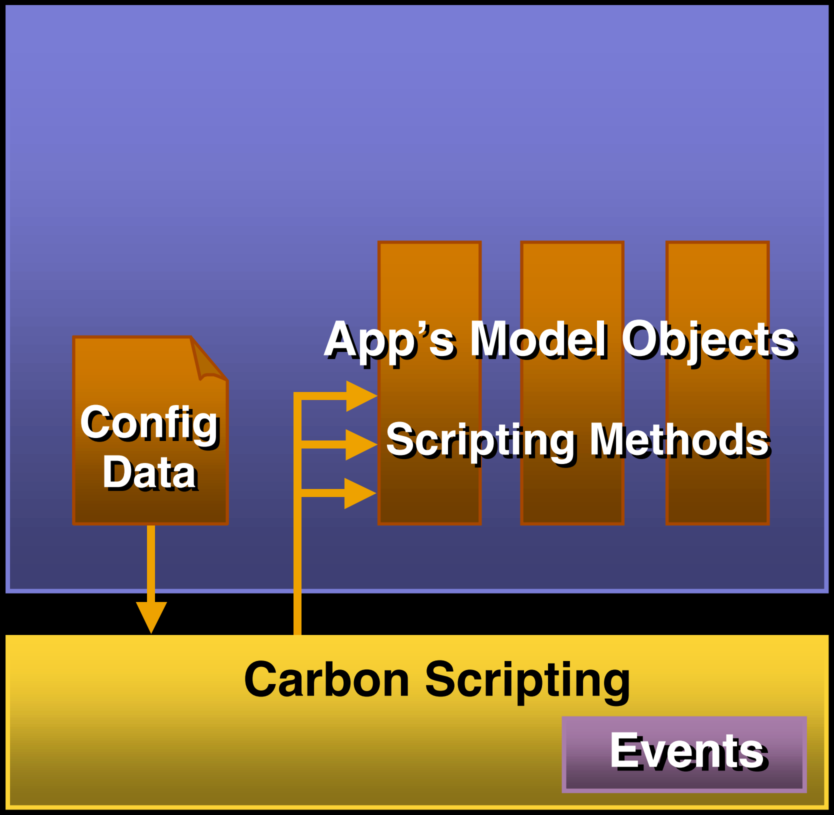
Config Data

Count, Get Element, Get Property, Make, Save

Carbon Scripting

Events

With a C++ application



Config Data

App’s Model Objects

Scripting Methods

Carbon Scripting

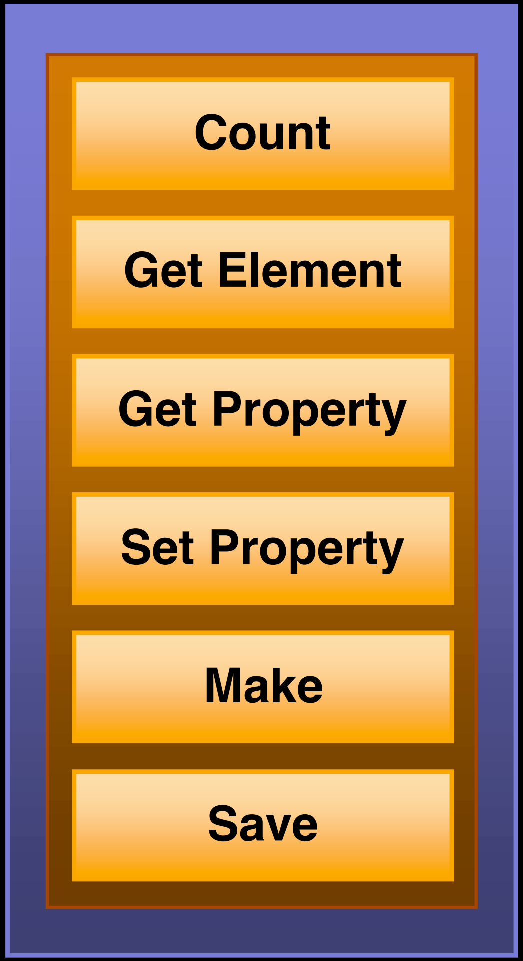
Events

Defining an Object

- .sdef file defines
  - Terminology
  - Four-character codes (optional)
  - Inheritance relationships
  - Containment (element) relationships
  - Properties
  - Supported verbs

Defining an Object

- Provide functions for:
  - Getting contained elements
  - Getting and setting properties
  - Supported verbs (make, delete, save, etc.)



What Carbon Scripting Handles

- Given “get-every” and property accessors . . .
  - “count” and “exists”
  - Any other access form: name, ID, range, relative, whose, some . . .

Scriptable Application Plug-ins

- ObjectSupportLib gets in the way
  - Must maintain 1-to-1 code/term relationship
  - One accessor for all properties of an object
  - Does not know anything about verbs
- Codeless terminology and Carbon Scripting remove the blocks

AppleScript X

- Support for codeless terminology
- Support for Unicode source
- Support for AppleScript plug-ins
    - Gradual obsolescence of OSAXen

Unicode Scripts

- Strings and comments are full Unicode
- Identifiers are not (but maybe later)
- Only one string class–no separate Unicode text class

Demo

AppleScript Plug-ins

- API similar to Carbon Scripting
- Can define first-class objects
  - Properties and elements, not just verbs
  - Full object model support
- Can extend existing objects
  - Add new properties, elements, verbs
- Extend AppleScript itself, not applications
- Scripts declare which plug-ins they use

AppleScript Plug-ins

- Planned for Jaguar
    - Process
    - File, folder, disk
- On the list
    - Basic types: list, record, string
    - Application
    - URL
    - XML
    - Streams (file, network, process)

Transition to AppleScript X

- AppleScript 1.x stays around for compatibility
- New features go into AppleScript X
- AppleScript X will execute most 1.x scripts

What Can You Do Now?

- Start using sdef files
    - sdp, sdef.dtd, and examples in Jaguar seed
- Compile UTF-8 scripts with AppleScript X
- Give us feedback!

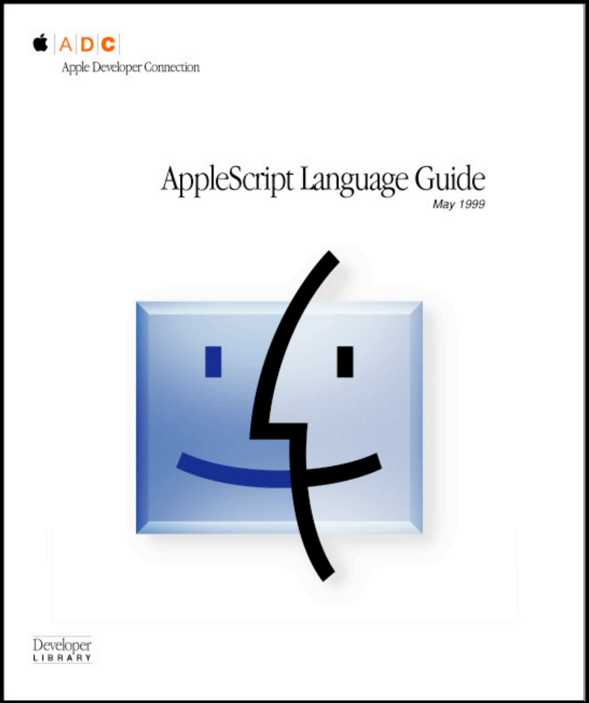
What Can You Do Later?

- Jaguar
    - Use sdefs to build aete and Cocoa Scripting
    - Develop for Carbon Scripting
    - Test with AppleScript X beta
- Post-Jaguar
    - Ship Carbon Scripting-based applications
    - Ship AppleScript X scripts and plug-ins

AppleScript Documentation

Documentation

OSA Scripting and AppleScript



ADC
Apple Developer Connection

AppleScript Language Guide
May 1999

Developer
LIBRARY

- AppleScript Scripting Language
- AppleScript Studio
- Apple Event Manager
- XML-RPC and SOAP
- Open Scripting Architecture
- Cocoa Scripting Topics

Documentation > Mac OS X > Core Technologies > AppleScript
developer.apple.com/techpubs/macosx/CoreTechnologies/coretechnologies.html

Documentation Status

- AppleEvents and Scripting
    - Updating AE Reference to cover new API, fix bugs
    - Tech notes for AEBuild, streaming, etc.
- XML-RPC and SOAP
    - Standalone documentation available

Documentation Status

- AppleScript Language Guide
  - Being updated to reflect 1.9
- AppleScript X
  - Documents available post-Jaguar

Summary

- AppleScript 1.9 coming in Jaguar
    - More scriptability
    - Minor enhancements
- AppleScript X as a developer release on Jaguar
    - Significant architectural advance

Summary

What you can do with the Jaguar Developer Preview

- Test your app for Apple Event compatibility
- Take advantage of better Cocoa Scripting
- Start writing terminology in .sdef format
    - Use sdp to generate Cocoa or Carbon dictionaries

Roadmap

902 AppleScript Studio Intro: Build full Cocoa applications with AppleScript	Civic **Wed., 3:30pm**
303 Cocoa Scripting: The easiest way to a scriptable app	Room A2 **Thurs., 10:30am**
FF007 AppleScript: Let us know what you think!	Room J1 **Thurs., 3:30pm**

Whom to Contact

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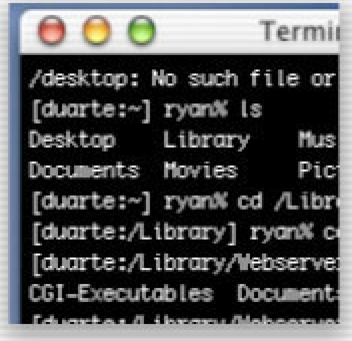
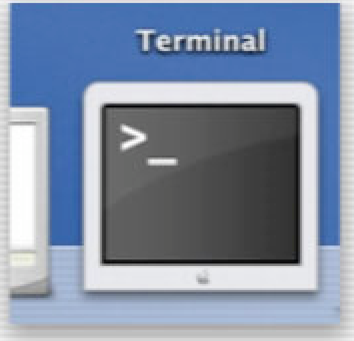
cde@apple.com

http://developer.apple.com/wwdc2002/urls.html

Q&A



```
/desktop: No such file or
[duarte:~] ryan% ls
Desktop    Library    Mus
Documents  Movies     Pic
[duarte:~] ryan% cd /Libr
[duarte:/Library] ryan% c
[duarte:/Library/Webserve
CGI-Executables  Document
```



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